

Retroreflectivity:

Raising the Nighttime
Brightness of Traffic
Signs and Markings



FHWA/Safety HSA-1

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Why Retroreflectivity?

The purpose of the project is to raise the nighttime visibility of traffic signs and markings on your roads.

This convention increases:

- Efficient traffic flow
- Driving comfort
- Highway safety



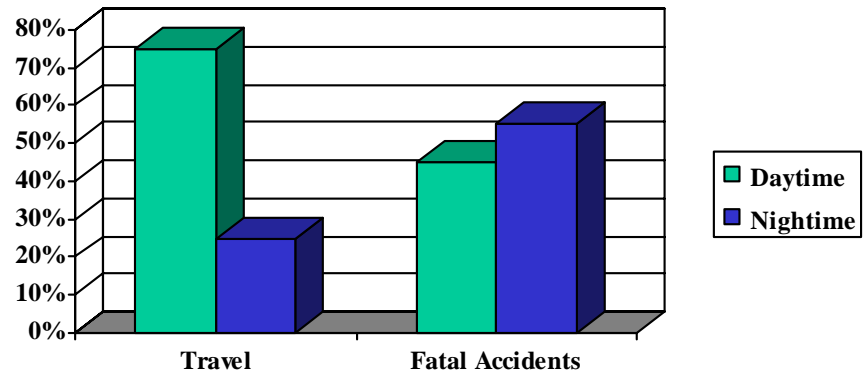
Background



Retroreflectivity is the light shined on a sign or pavement marking that comes right back at you. In 1993, the United States congress directed the U.S. Department of transportation to include a minimum level of retroreflectivity for signs and pavement markings in the Manual of Uniform Traffic Control Devices (MUTCD). Subsequently, the FHWA initiated a program to develop instruments to measure the retroreflectance of signs and markings.

Problem Addressed

Retroreflective sign sheeting and pavement marking paints degrade with effects of weather and traffic. We have a large aging driver population which needs brighter signs and pavement markings to maintain their mobility. For example, inadequate and poorly maintained signs and markings are often cited as the contributing factor to accidents. While only 25 percent of travel occurs at night, about 55 percent of the fatal accidents occur then. It is difficult to determine the best time to replace retroreflective signs and markings. Too soon increases maintenance costs. Too late compromises safety and driving comfort.



Goal

In a highway environment, retroreflectivity is important because it promotes efficient traffic flow, driving comfort and highway safety. The goal of this project is to improve the in-service performance of traffic signs and markings by creating tools, retroreflectometer equipment for measuring the nighttime visibility of signs and markings for the purpose of:

- Development and commercialization of tools for measuring sign and pavement marking retroreflectivity
- Encouraging the implementation of guidelines nationwide by providing workshops on the guidelines and the technology.
- Encouraging implementation of sign and pavement marking management programs in state and local highway agencies.

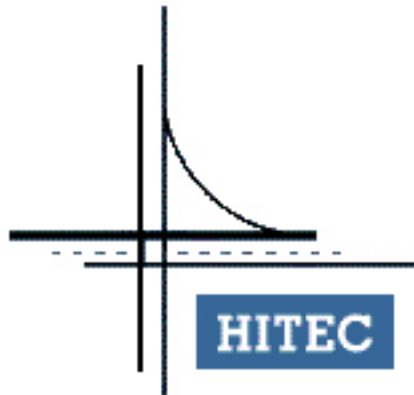
State of the Art Measurement Tools



This project helps solve the problem by giving highway departments state of the art measurement tools and techniques that they can use to scientifically evaluate the actual condition of highway signs and pavement markings along the highways.

State of the Art Measurement Tools

Through the Highway Innovative Technology Evaluation Center (HITEC) the FHWA conducts side-by-side testing of all retroreflectometer equipment. This feeds the development of specifications dealing with the subject technologies and provides potential users sufficient information to make purchasing decisions.



Other Key Points:

- The Mobile Pavement Marking Van was developed in partnership with the private sector through the Small Business Innovative Research Program and has been successfully commercialized. It can take many retroreflectance readings while driving down the road at highway speeds. It is this unique feature of quickly handling vast amounts of data that will help highway department personnel determine when pavement markings need to be replaced.



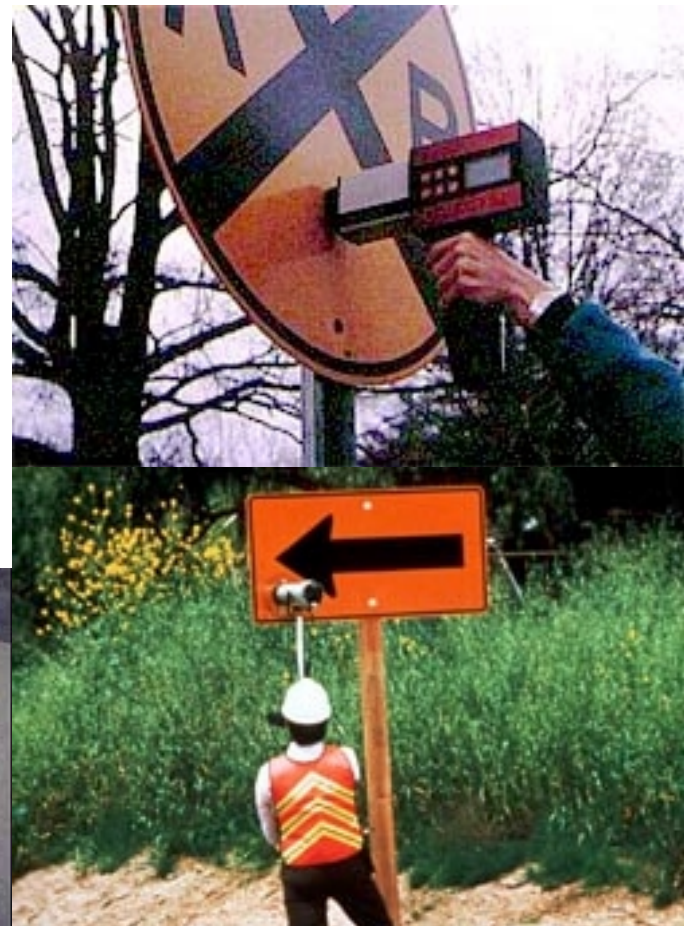
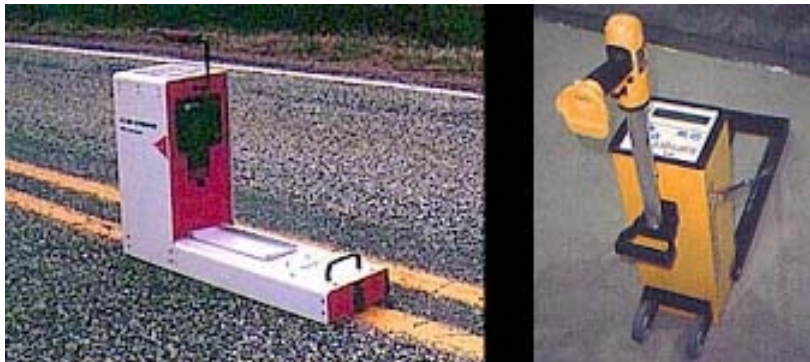
Other Key Points



- The Mobile Sign Retroreflectometer Van evaluates the condition of the retroreflective sheeting used on the highway signs. It is being designed and constructed through an interagency agreement with the Naval Research Laboratory located in South West Washington D.C. The technology will be available for demonstration from the Fall of 1998 through the Fall of 1999 and ready for commercialization.

Other Key Points:

- Hand – held Sign and Pavement Marking Retroreflectometers
In addition to the mobile retroreflectometers the FHWA is promoting lower – cost hand – held ones. These can be widely deployed in the field to spot-check the conditions of selected retroreflective signs and pavement



Other Key Points:

- With these tools highway department personnel can now efficiently monitor the condition of retroreflective signs and markings and feel confident that they are maintaining them for optimum safety, performance, and economy.

Development of Minimum Retroreflectivity Guidelines

- In partnership with Research and the Office of Safety the project developed proposed retroreflection guidelines for signs and markings and encourage their implementation. It will develop and conduct workshops to a select audience of State and local highway key personnel to get preliminary input on the proposed minimum retroreflectivity values before issued in the Federal Register for rulemaking.



Development of Minimum Retroreflectivity Guidelines

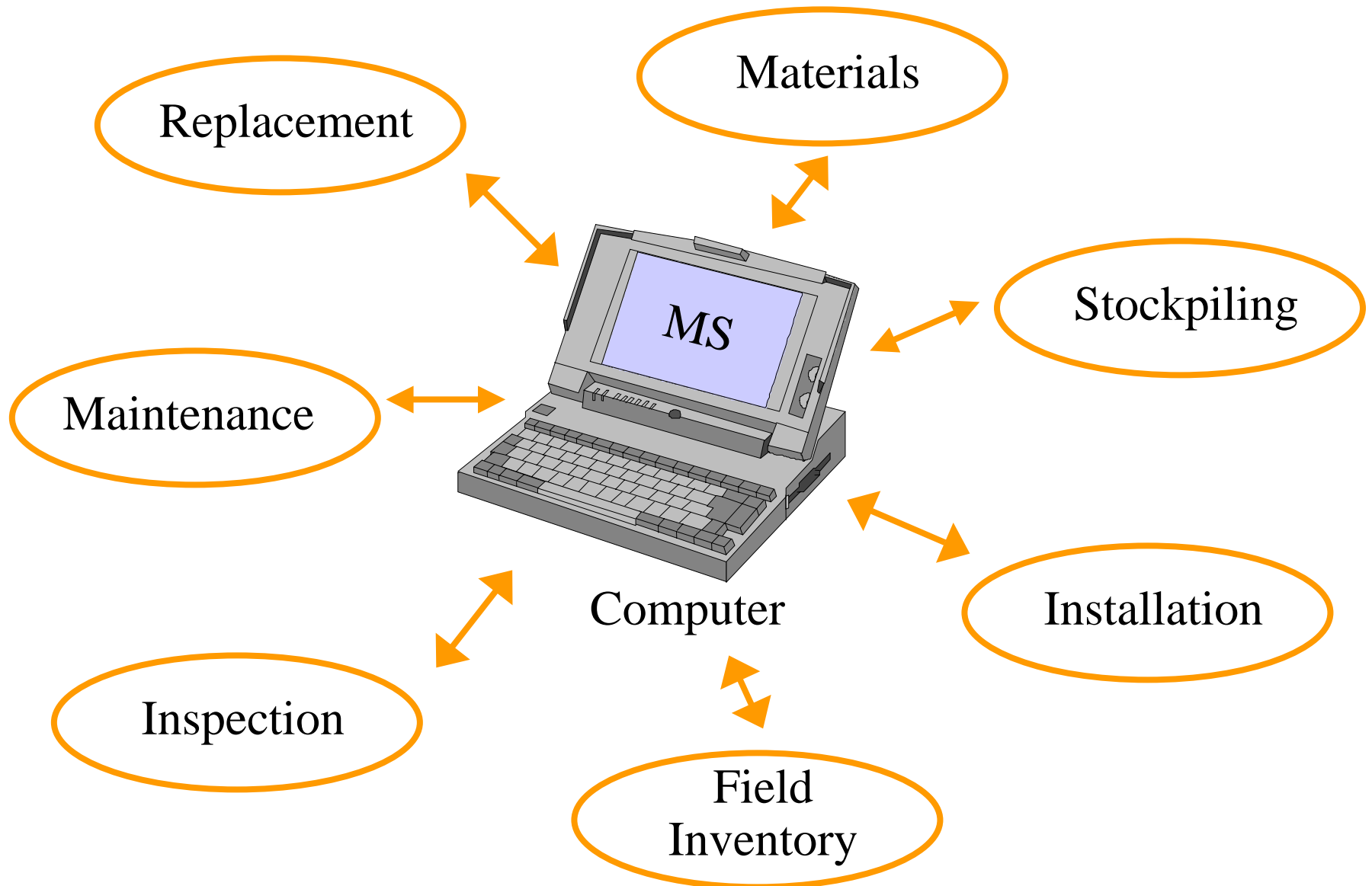


- The rulemaking process provides an opportunity for all interested parties to comment on the proposal. When the FHWA guidelines are approved, they will be included in the Manual on Uniform Traffic Control Devices (MUTCD), which is applicable to all roads, streets, and highway in the United States.

Sign and Pavement Marking Management

- Efforts are underway to encourage State and local highway agencies to implement sign and pavement marking management. Replacing signs and pavement markings when they reach minimum levels of retroreflectivity is the best way to get the full life of signs and markings. To achieve this the FHWA is advocating development and implementation (by State and local highway agencies) of sign and pavement marking management systems. A sign or pavement marking management system is a coordinated program of policies and procedures which ensure that highway agencies provide a system that meets the needs of the road users most cost-effectively, within available budgets and constraints.

Integrating Sign and Pavement Marking Activities



Sign and Pavement Marking Management



- The Sign Inventory Management System developed by Research has been updated to run on Windows 95/NT. The Pavement Marking Management System developed by Minnesota DOT under Work Order Agreement is available to other State and local highway agencies.

For More Information

For more information about Retroreflectivity,
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